REMARKS

Claim 1 has been amended to better claim the invention and to incorporate the limitations of as-filed claim 2, as well as to state the particular enzymatic activity; support is found in the as-filed Specification at page -9, bridging paragraph, for example. Accordingly, claim 2 has been canceled without prejudice. Certain claims have been canceled without prejudice in view of the finality of the requirement for restriction. None of the amendments made herein constitutes the addition of new matter.

The Requirement for Restriction

The Examiner has made the requirement for restriction final and has required that the claims be limited only to SEQ ID NOs:1 and 2, as elected species.

Applicants have canceled certain nonelected claims without prejudice, reserving the right to pursue that subject matter in a subsequent application.

The Specification

The Abstract has been objected to for failure to specify the gene elected for examination.

In the interest of advancing prosecution, Applicants have amended the Abstract to recite the elected species.

The Title of this application has been objected to as allegedly not descriptive.

In the interest of advancing prosecution, Applicants have amended the title in accordance with the suggestion of the Examiner.

The Rejections under 35 U.S.C. 112, second paragraph

Claim 1, 2, 4, 5, 11, 13, 16 and 25 have been rejected under 35 U.S.C. 112, second paragraph, as allegedly indefinite. Applicants respectfully traverse this rejection.

The Patent Office has alleged that the claims are indefinite in the recitation of a broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation. Specifically, the Patent Office has rejected the recitation of GALAT1 and GALAT in the same claim.

In the interest of advancing prosecution and without acquiescing to the rejection, Applicants have amended claim 1 to specify the sequence relationship of the claimed polypeptide to SEQ ID NO:2 (at least 50% similar); the GALAT1 recitation is intended to specify the enzymatic activity of the claimed encoded protein, whether it comprises the sequence set forth in SEQ ID NO:2 or has a sequence of the noted similarity to that of SEQ ID NO:2. The Specification describes the particular galacturonosyl transferase activity of the claimed proteins (transfer of galacturonosyl residues to polymerized (homo)galacturonic acid residues, as was specifically exemplified for the GALAT1 (SEQ ID NO:2). Applicants respectfully submit that the language of claim 1 is abundantly clear and definite in the eyes of the person of ordinary skill in the art, and the rejection should be withdrawn.

The Rejections under 35 U.S.C. 112, first paragraph

Claims 1, 2, 4, 11, 13 and 16 remain rejected under 35 U.S.C. 112, first paragraph, as allegedly failing to comply with the written description requirement, and claims 1, 2, 4, 11, 13 and 16 remain 1 rejected under 35 U.S.C. 112, first paragraph, as the Specification is alleged to provide enablement for nucleic acids other than those encoding full length SEQ ID NO:2 or those encoding polypeptides with about 50% similarity to SEQ ID NO:2. Applicants respectfully traverse both rejections.

The Patent Office has characterized the claims as broadly drawn to nucleic acids encoding a polypeptide having galacturonosyl transferase 1 activity and to polypeptides with 50% similarity to SEQ ID NO:2, and to vectors and plants comprising same. Claim 3 has been interpreted to encompass polypeptides with about 50% identity to SEQ ID NO:2.

The Examiner has alleged that no polypeptides with 50% identity to SEQ ID NO:2 were known to have the GALAT activity.

Applicants respectfully provide a Declaration under 37 C.F.R 1.132 (of inventor Debra Mohnen) which presents the finding that the protein characterized by SEQ ID NO:8 has galacturonosyl transferase activity. As indicated in Table IV, this protein, now termed GAUT6, for galacturonosyl transferase, has 63% amino acid sequence similarity to SEQ ID NO:2 (GALAT1 as named in the present application and later named GAUT1). Applicants respectfully request that the Patent Office accept this as sufficient evidence to support the claimed genus of GALAT enzymes.

With respect to the recitation of 50% similarity, Applicants respectfully note that Specification provides a list of sequences which Applicants have stated encode active GalAT polypeptides (see page 19). In addition Applicants have amended claim 1 to recite “at least” 50% similarity in order to better claim the invention. Support is found at page 8, first paragraph, of the as-filed Specification. Certainly it is well known in the art that some variation in sequence can be tolerated so that enzymatic activity could be maintained, and the Specification teaches, at page 22, first full paragraph. In addition, Figure 7 provides conserved amino acids in proteins of the GALAT gene family. The art knows that strictly conserved amino acids should not be varied. Thus, Applicants have provided certain guidance concerning parts of the protein which should be conserved. New claim 26 recites a nucleic acid comprising a (nucleotide) sequence with at least 90% sequence identity to SEQ ID NO:1 and encoding a polypeptide having GALAT1 activity. Support is found at page 59, first paragraph, for example. Applicants have

stated that polypeptides with at least 50% sequence identity to the protein of SEQ ID NO:2 have GALAT activity, and the Patent Office should accept the inventors' assertions in their field of scientific expertise.

The relevant arts to this invention are biochemistry and molecular biology, and those of ordinary skill in that art are highly educated (most having advanced degrees) and technically sophisticated. Therefore, Applicants respectfully maintain that the present Specification, taken with what is well known to the art, enables the practice of the invention as claimed without the burden of undue experimentation. Applicants have taught conserved regions of the protein, and methodology is known to establish whether or not a sequence falling within the scope of the instant claims has the requisite function.

Applicants have provided herewith, in support of patentability,.a copy of Sterling et al. (2006) with its supporting documents. Figure 9 of the supporting information is a sequence alignment which shows the relatedness of certain GALAT family members, We note that SEQ ID NO:2 corresponds to the sequence identified in this figure as At3g61130, and SEQ ID NO:8, demonstrated to also have GALAT1 enzymatic activity, corresponds to the sequence identified as At1g06780.

In view of the foregoing arguments and the amendments to the claims, Applicants respectfully maintain that the claims are adequately supported by a fully enabling disclosure and appropriate written description of the claimed subject matter. Accordingly, Applicants respectfully request the withdrawal of this rejection.

The Rejections under 35 U.S.C. 102

Claims 1, 2, 11, 13 and 16 have been rejected under 35 U.S.C. 102(a) as allegedly anticipated by Harper et al. (US 2002/0160378). Applicants respectfully traverse this rejection.

Harper is said to teach a nucleic acid encoding a protein with 53.7% identity to SEQ ID NO:2 of this application. Harper teaches a method of producing a transgenic plant with altered responsiveness to at least one stress condition by using SEQ ID NO:1120. The Patent Office has conceded that there is no teaching of GALAT activity but concluded that if the sequence relatedness to the present SEQ ID NO:2 is sufficient for GALAT activity, then there would inherently be such activity in the protein of SEQ ID NO:1120.

In the interest of advancing prosecution and without acquiescing to the rejection, Applicants have amended the claims to specify the enzymatic activity in addition to sequence relatedness.

Applicants respectfully note that the present claims, as amended to better claim the invention, recite a combination of structural relatedness (at least 50% similarity) and function (transfer of galacturonosyl residues to polymerized galacturonic acid. (as specifically exemplified for GALAT1) Accordingly, claim 2 has been canceled without prejudice. activity). This is not taught by the prior art, as admitted by the Patent Office. There is no indication in the cited art that the protein of SEQ ID NO:1120 has any enzymatic activity, let alone the present claimed activity. For a proper anticipation rejection, the inherency must be a necessary aspect of the prior disclosure.

The Examiner has pointed to claim 29, 35, 42 and 43 but these claims also do not appear to point to either the particular sequence or the particular function as recited in the claims in the present application.

Accordingly, the rejection under Section 102(a) is not proper and must be withdrawn.

In view of the foregoing discussion and the amendment to the claim, Applicants respectfully request the withdrawal of the rejection.

Claims 1, 2, 11, 13 and 16 have been rejected under 35 U.S.C. 102(b) as allegedly anticipated by Liu et al. (US 2004/0034888). Applicants respectfully traverse this rejection.

Liu is said to teach a protein (their SEQ ID NO:32781) with 64.1% identity to the present SEQ ID NO:2 and a method of producing a transgenic plant with an improved property. The Patent Office has conceded that there is no teaching of GALAT activity but concluded that if the sequence relatedness to the present SEQ ID NO:2 is sufficient for GALAT activity, then there would inherently be such activity in the protein of SEQ ID NO:32781.

In the interest of advancing prosecution and without acquiescing to the rejection, Applicants have amended the claims to specify the enzymatic activity in addition to sequence relatedness.

Applicants respectfully note that the present claims, as amended to better claim the invention, recite a combination of structural relatedness (at least 50% similarity) and function (GALAT1 activity, as described above). This is not taught by the prior art, as admitted by the Patent Office. There is no indication in the cited art that the protein of SEQ ID NO:32781 has any enzymatic activity, let alone the present claimed activity. For a proper anticipation rejection, the inherency must be a necessary aspect of the prior disclosure. Furthermore, it appears that the cited application does not point to the present claimed sequence in claim and related sequences as claimed with the particular function; but rather SEQ ID NO:32781 appears to be buried in a haystack comprising a large number of sequences.

Accordingly, the rejection under Section 102(b) is not proper and must be withdrawn.

The Rejections under 35 U.S.C. 103

Claims 1, 2, 11, 13 and 16 have been rejected under 35 U.S.C. 103(b) as allegedly unpatentable over Brummell et al. (2001) in view of Tavares. Applicants respectfully traverse this rejection.

The Patent Office has alleged that the instant claims are obvious over the cited art because there was a recognized need in the art to develop methods to manipulate fruit ripening and plant cell walls, there had been a finite number of potential solutions and one of ordinary skill could have pursued any of the potential options with a reasonable expectation of success at the time of the invention. Brummell is said to teach that cell wall metabolism is important for fruit softening and quality. It is acknowledged that there is no teaching of a protein with at least 50% sequence identity to SEQ ID NO:2, but Brummell does not teach the importance of the galacturonosyl transferases which transfer galacturonic acid residues to galacturonic acid polymers or oligomers (nor does the cited Tavares reference). Tavares is said to teach a nucleic acid encoding a protein with 90.45% identity to SEQ ID NO:2 (LGT1) and it is identified as a glycosyl transferase. The Patent Office is further said to teach that this protein catalyzes the transfer of glycosyl groups to a carbohydrate core.

Applicants respectfully point out that Tavares references to proteins "like glycosyl transferases – proteins that are homologous to lipooligosaccharide glycosyltransferases of *Neisseria gonorrhoeae* and *Escherichia coli*. There are myriad glycosyl transferases in plants – they are involved in functions from cell wall synthesis to various polysaccharides to auxin metabolism. There is nothing in the cited references which would have led the skilled artisan to the particular nucleic acid molecules and encoded polypeptides, which are claimed in the present application by recitations of structure and function.

In view of the foregoing, the present claimed invention is not properly found obvious over the cited references, and the rejection must be withdrawn.

Conclusion

In view of the foregoing, this case is considered to be in condition for allowance and passage to issuance is respectfully requested.

If there are any outstanding issues related to patentability, the courtesy of a telephone interview is requested, and the Examiner is invited to call to arrange a mutually convenient time.

This response is accompanied by a Petition for Extension of Time and payment in the amount of $555.00 as required by 37 C.F.R. 1.17(a) by charge to Deposit Account No. 07-1969. If any additional fees, or any further extensions of time, are due pursuant to 37 C.F.R. 1.16-1.17, please charge the appropriate amount due to Deposit Account No. 07-1969.

Respectfully submitted,

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